

**IN THE UNITED STATES  
PATENT AND TRADEMARK OFFICE**

Appl. No. : 10/578,644  
Applicant(s): Peter Klaus Bachmann, et al.  
Filed: May 9, 2006  
TC/A.U.: 2800/2823  
Examiner: Walter H. Swanson  
Atty. Docket: DE 030388  
Confirmation No.: 1509  
Title: ELECTRONIC DEVICE COMPRISING A  
PROTECTIVE BARRIER LAYER STACK

**APPEAL BRIEF**

Honorable Assistant Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Sir:

In connection with the Notice of Appeal dated **April 28, 2009**, Applicants provide the following Appeal Brief in the above-captioned application.

## **1. Real Party in Interest**

The real party in interest as assignee of the entire right and title to the invention described in the present application is Koninklijke Philips Electronics, N.V., having a principal place of business at Groenewoudseweg, 1Eindhoven, NL 5621 BA .

## **2. Related Appeals and Interferences**

There are no known related appeals or interferences at the time of filing of the present Appeal Brief.

## **3. Status of the Claims**

Claims 1-15 and 19-20 are pending at this time. Claims 1-15 and 19-20 are finally rejected. Claims 1-15 and 19-20 are the subject of the present appeal. The claims on appeal are provided in the Appendix.

## **4. Status of the Amendments**

A final rejection was mailed on January 28, 2009. A response under Rule 116 was filed within the two-month period of the final rejection, and an advisory action was mailed indicating entry of the response under Rule 116.

## **5. Summary of the Claimed Subject Matter<sup>1</sup>**

### **Referring to claim 1:**

In accordance with a representative embodiment, an electronic device comprises a protective barrier layer stack (e.g., 4 in Fig. 1) comprising a first barrier layer of a first amorphous carbon modification (e.g., 4a in Fig. 1) and a second barrier layer of a second amorphous carbon modification (e.g., 4a in Fig. 1). (Kindly refer to claim 1; Fig. 1; page

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<sup>1</sup> In the description to follow, citations to various reference numerals, drawings and corresponding text in the specification are provided solely to comply with Patent Office Rules. It is emphasized that these reference numerals, drawings and text are representative in nature, and in not any way limiting of the true scope of the claims. It would therefore be improper to import any meaning into any of the claims simply on the basis of illustrative language that is provided here only under obligation to satisfy Patent Office rules for maintaining an Appeal.

8, line 14 through page 12, line 10 of the filed application.)

**Referring to claim 19:**

In accordance with a representative embodiment, a method of fabricating an electronic device comprising an electroluminescent diode, the method comprising: forming a protective barrier layer stack (e.g., 4 in Fig. 1), the forming comprising: depositing a first amorphous carbon modification from a gas phase (e.g., 4a in Fig. 1); and depositing a second amorphous carbon modification from a gas phase (e.g., 4b in Fig. 1). (Kindly refer to claim 19; Fig. 1; page 12, line 11 through page 13, line 29 of the filed application.)

**6. Grounds of Rejection to be Reviewed on Appeal**

The grounds of rejection to be reviewed on appeal are whether:

- I. Claims 1-3, 13, 14, 19 and 20 were properly rejected under 35 U.S.C. § 102(b) in view of *Motomatsu* (JP Patent Publication 2000-133440).
- II. Claims 5-9, 12, and 15 were properly rejected under 35 U.S.C. § 103(a) in view of *Motomatsu*.
- III. Claim 4 was properly rejected under 35 U.S.C. § 103(a) in view of *Motomatsu* and *Murazuki, et al.* (JP Patent Publication 2003-178867).
- IV. Claims 10 and 11 were properly rejected under 35 U.S.C. § 103(a) in view of *Motomatsu* and *Jones* (U.S. Patent 5,920,080).

**7. Argument**

**I. Rejection of claims 1-3, 13, 14, 19 and 20 under 35 U.S.C. § 102(b) in view of *Motomatsu***

At the outset Applicants rely at least on the following standards with regard to proper rejections under 35 U.S.C. § 102. Notably, a proper rejection of a claim under 35

U.S.C. § 102 requires that a single prior art reference disclose each element of the claim. *See, e.g., W.L. Gore & Assoc., Inc. v. Garlock, Inc.*, 721 F.2d 1540, 220 USPQ 303, 313 (Fed. Cir. 1983). Anticipation requires that each and every element of the claimed invention be disclosed in a single prior art reference. *See, e.g., In re Paulsen*, 30 F.3d 1475, 31 USPQ2d 1671 (Fed. Cir. 1994); *In re Spada*, 911 F.2d 705, 15 USPQ2d 1655 (Fed. Cir. 1990). Alternatively, anticipation requires that each and every element of the claimed invention be embodied in a single prior art device or practice. *See, e.g., Minnesota Min. & Mfg. Co. v. Johnson & Johnson Orthopaedics, Inc.*, 976 F.2d 1559, 24 USPQ2d 1321 (Fed. Cir. 1992). For anticipation, there must be no difference between the claimed invention and the reference disclosure, as viewed by a person of ordinary skill in the field of the invention. *See, e.g., Scripps Clinic & Res. Found. v. Genentech, Inc.*, 927 F.2d 1565, 18 USPQ2d 1001 (Fed. Cir. 1991).

i. Independent claims 1 and 19:

a. Claim 1 recites:

*An electronic device comprising a protective barrier layer stack comprising a first barrier layer of a **first amorphous carbon modification** and a second barrier layer of a **second amorphous carbon modification**.*

In rejecting claim 1, the Office Action directs Applicants to a first carbon protective film 7 and a second carbon protective film 8 for the alleged disclosure of the emphasized features of claim 1. Films 7 and 8 are formed on a ground film 6 of amorphous silicon. Paragraph [0014] of *Motomatsu* discloses a diamond like carbon (DLC) layer DLC protective layer 5 (see Fig. 1) there is no disclosure that this layer comprises amorphous carbon modifications. Furthermore, the Office Action does not direct Applicants to layer 5 for the first barrier layer comprising a first amorphous carbon modifications, or for the second barrier layer comprising second modifications as specifically set forth in claim 1. Rather, as noted above, the Office Action directs Applicants to the first and second protective films 7,8 for the featured first and second barrier layers. Paragraphs [0014], [0019] and [0020] of *Motomatsu*, describe the first and

second carbon protective films 7,8 and their fabrication. The first and second carbon protective films 7, 8 of *Motomatsu* include various levels of hydrogen, with the second protective film 8 seemingly having an insubstantial amount of hydrogen. Moreover, paragraph [0019] of *Motomatsu* describes reduced stress in the DLC layer 5 when forming layer 7 in abbreviated hydrogen content pressure. Similarly, paragraph [0020] of *Motomatsu* points to a heightened hardness of the DLC layer 5 when the layer 8 is formed in reduced hydrogen content pressure. While the formation of layers 7 and 8 are described in connection with results desired of the DLC layer, there is no disclosure that the layers 7 and 8 are barrier layers comprising amorphous carbon modifications as specifically recited in claim 1. As such, and for at least the reasons set forth above, Applicants respectfully submit that while certain details of the carbon protective films are described, **the references fails to disclose that these layers are amorphous, and especially fails to disclose that these are amorphous carbon modifications**. (See paragraphs [0014], [0019] and [0020] of the translation provided in the Office Action).

Accordingly, Applicants respectfully submit that the applied art fails to disclose at least one feature of claim 1. As such, a *prima facie* case of anticipation cannot be established based on *Motomatsu*. Therefore, claim 1 is patentable over the applied art.

b. Claim 19 recites:

Claim 19 recites:

*A method of fabricating an electronic device comprising an electroluminescent diode, the method comprising:*

*forming a protective barrier layer stack, the forming comprising:*

*depositing a **first amorphous carbon modification** from a gas phase; and  
depositing a **second amorphous carbon modification** from a gas phase.*

The Office Action directs Applicants to first carbon protective film 7 and a second carbon protective film 8 for the alleged disclosure of the emphasized features of claim 19. The Office Action specifically directs Applicants to paragraph [0014] and Fig.

2 and attempts to equate the forming of the first carbon protective film 7 with the featured *depositing a first amorphous carbon modification from a gas phase*; and to the forming of the second carbon protective film 8 over the first carbon protective film 7 for the featured *depositing a second amorphous carbon modification*. As discussed above with the traversal of the rejection of claim 1, and for reasons consistent with those presented in the traversal of the rejection of claim 1, Applicants respectfully submit that the applied art fails to disclose at least amorphous carbon modifications and thus cannot disclose their being deposited as specifically recited in claim 19. Accordingly, Applicants respectfully submit that *Motomatsu* fails to disclose at least one feature of claim 19. As such, a *prima facie* case of anticipation cannot be established based on *Motomatsu*. Therefore, claim 19 is patentable over the applied art.

Since claims 2, 3, 13, 14 and 20 each depend from a base claim that is believed to be in condition for allowance, Applicant believes that it is unnecessary at this time to argue the allowability of each of the dependent claims, which are rejected under 35 U.S.C. § 102 as outlined above, individually. Applicant does not, however, necessarily concur with the interpretation of any dependent claim as set forth in the Office Action, nor does Applicant concur that the basis for the rejection of any dependent claim is proper. Therefore, Applicant reserves the right to specifically address the patentability of the dependent claims in the future, if deemed necessary.

## **II. Rejection of claims 5-9, 12 and 15 under 35 U.S.C. § 103(a) in view of *Motomatsu***

Claims 5-9, 12 and 15 each depend from claim 1 directly or indirectly. Claim 1 is believed to be patentable over the applied art for at least the reasons set forth in I., above. As such, Applicant respectfully submits that claims 5-9, 12, 15 and 17 are patentable for at least the same reasons as claim 1. Therefore, Applicant believes that it is unnecessary at this time to argue the allowability of each of the dependent claims, which are rejected under 35 U.S.C. § 103 as outlined above, individually. Applicant does not, however, necessarily concur with the interpretation of any dependent claim as set forth in the Office Action, nor does Applicant concur that the basis for the rejection of any dependent claim is proper. Therefore, Applicant reserves the right to specifically address the patentability of the dependent claims in the future, if deemed necessary.

**III. Rejection of claim 4 under 35 U.S.C. § 103(a) in view of *Motomatsu and Murazuki, et al.* (JP Patent Publication 2003-178867)**

Claim 4 depends from claim 1. Claim 1 is believed to be patentable over the applied art for at least the reasons set forth in I., above. As such, Applicant respectfully submits that claim 4 is patentable for at least the same reasons as claim 1. Therefore, Applicant believes that it is unnecessary at this time to argue the allowability of each of the dependent claims, which are rejected under 35 U.S.C. § 103 as outlined above, individually. Applicant does not, however, necessarily concur with the interpretation of any dependent claim as set forth in the Office Action, nor does Applicant concur that the basis for the rejection of any dependent claim is proper. Therefore, Applicant reserves the right to specifically address the patentability of the dependent claims in the future, if deemed necessary.

**IV. Rejection of claims 10 and 11 under 35 U.S.C. § 103(a) in view of *Motomatsu and Jones* (U.S. Patent 5,920,080).**

Claims 10 and 11 depend from claim 1. Claim 1 is believed to be patentable over the applied art for at least the reasons set forth in I., above. As such, Applicant respectfully submits that claim 4 is patentable for at least the same reasons as claim 1. Therefore, Applicant believes that it is unnecessary at this time to argue the allowability of each of the dependent claims, which are rejected under 35 U.S.C. § 103 as outlined above, individually. Applicant does not, however, necessarily concur with the interpretation of any dependent claim as set forth in the Office Action, nor does Applicant concur that the basis for the rejection of any dependent claim is proper. Therefore, Applicant reserves the right to specifically address the patentability of the dependent claims in the future, if deemed necessary.

### **Conclusion**

In view of the foregoing, applicant(s) respectfully request(s) that the Examiner withdraw the objection(s) and/or rejection(s) of record, allow all the pending claims, and find the application in condition for allowance.

If any points remain in issue that may best be resolved through a personal or telephonic interview, the Examiner is respectfully requested to contact the undersigned at the telephone number listed below.



Respectfully submitted on behalf of:  
Philips Electronics North America Corp.

/William S. Francos/

by: William S. Francos (Reg. No. 38,456)

Date: June 22, 2009

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**APPENDIX**

**Claims on Appeal**

1. An electronic device comprising a protective barrier layer stack comprising a first barrier layer of a first amorphous carbon modification and a second barrier layer of a second amorphous carbon modification.
2. An electronic device according to claim 1, wherein the electronic device is an organic electroluminescent device.
3. An electronic device according to claim 1, wherein the first and the second amorphous carbon modification are selected from the group of amorphous carbon modifications comprising amorphous carbon, tetrahedral amorphous carbon, hydrogenated amorphous carbon, tetrahedral hydrogenated amorphous carbon, diamond-like-carbon, and glassy carbon.
4. An electronic device according to claim 1, wherein the first and the second amorphous carbon modification are selected from the group of doped amorphous carbon modifications, wherein the dopant is selected from the group of boron, silicon, nitrogen, phosphorus, oxygen, and fluorine.
5. An electronic device according to claim 1, wherein at least one of the first and second barrier layers comprising a first or second amorphous carbon modification is selected from the barrier layers having a plasmon energy  $>27$  eV.
6. An electronic device according to claim 1, wherein the first and the second amorphous carbon modification are selected from the group of amorphous carbon modifications having a refractive index  $n > 1.8$ .
7. An electronic device according to claim 1, wherein the first and the second amorphous carbon modification are selected from the group of amorphous carbon modifications having a refractive index  $n > 2.0$ .

8. An electronic device according to claim 1, wherein the first barrier layer of a first amorphous carbon modification has a first refractive index and the second barrier layer of a second amorphous carbon modification has a second refractive index higher than the first refractive index.
9. An electronic device according to claim 1, wherein the first barrier layer of a first amorphous carbon modification has a first refractive index  $n_1 > 1.8$  and the second barrier layer of a second amorphous carbon modification has a second refractive index  $n_2 > 2.0$ .
10. An electronic device according to claim 1, comprising an interlayer between the first barrier layer of a first amorphous carbon modification and a second barrier layer of a second amorphous carbon modification.
11. An electronic device according to claim [[6]]10, wherein the interlayer comprises a polymer selected from the group of parylenes, benzocyclobutanes, polyimides, fluorinated polyimides, poly(arylene ethers), poly(naphthalenes), poly(norbornes), fluoropolymers (e.g. PTFE), chlorofluoropolymers(PCFP), and hydrocarbons.
12. An electronic device according to claim 11, wherein all amorphous carbon modifications are selected from the group of amorphous carbon modification comprising at least 10% hydrogen bound to the carbon atoms.
13. An electronic device according to claim 1, comprising an adhesion layer between the first barrier layer of a first amorphous carbon modification and the electroluminescent diode.
14. An electronic device according to claim 1, comprising a top layer lying on and in contact with the second barrier of a second carbon modification.

15. An electronic device as claimed in claim 1, wherein the layer thickness of the barrier layer stack  $d \geq 30$  nm.

19. A method of fabricating an electronic device comprising an electroluminescent diode, the method comprising:

forming a protective barrier layer stack, the forming comprising:

depositing a first amorphous carbon modification from a gas phase; and  
depositing a second amorphous carbon modification from a gas phase.

20. A method as claimed in claim 20, wherein the depositing comprises a radio frequency (RF) plasma chemical vapor deposition (CVD).

## **APPENDIX**

### **Evidence**

**APPENDIX**

**Related Proceedings**